



FORTIFIED
SAMPOORNA POSHAN
SWASTH JEEVAN

FOOD FORTIFICATION

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FOOD SAFETY : NEED OF THE HOUR

- Prevalence of Anaemia and Malnutrition

Report	0 to 6 Yrs Children	15-49 Yrs Women	15-49 Yrs Men
NFHS-4 (2015-16)	54.2 %	62.5%	30.3%
NFHS-5 (2019-20)	69.0%	71.4 %	38.9%

- Public Health Issues : Impure and contaminated water or food.
- Increasing Lifestyle Disease [Cancer/ Cardi-Resp/Diabetes/ Obesity/ Kidney-Liver / Others.
- 6 deaths are NCD out of every deaths 10 in India.
- 3 of these deaths by Cardio-vascular dis-order.
- Contaminated food : affect 60 Cr people every Year worldwide .
- 1/3rd of World Population is estimated to be under-Nourished.
- Food Safety & Standards: Major Preventive Health Care Need of the Hour

INDIA FOOD FORTIFICATION PREMIX MARKET REPORT AND FORECAST 2019-2024

In 2018, the food fortification premix market in India attained a volume of more than 440 Metric Tons and was valued At more than INR 1.7 billion in 2018 owing to robust demand



WHAT IS FORTIFICATION?

FORTIFICATION

“Fortification” means deliberately increasing the content of essential micronutrients in a food so as to improve the nutritional quality of food and to provide public health benefit with minimal risk to health;



CONCEPT

Fortification is practice of **deliberately** increasing the content of essential micro-nutrients, so as to **improve the nutritional quality** of the food supply and to provide a public health benefit.

Advantages

- Simple
- Scalable
- Cost effective
- Sustainable
- Does not alter the characteristics of food
- Does not require any changes in food habits and eating patterns
- Technology and know-how exist in the country
- Enabling policy framework for food fortification exists
- Proven efficacy and effectiveness.

FOOD FORTIFICATION

- 1/3 of world's population is expected to be micronutrient deficient. Fortifying food helps in combating this issue.
- Food Safety and Standards (Fortification of Foods) Regulations, 2018 are now notified
- Processed foods are also included on 18 Dec 2020.

Double Fortified Salt	Edible Oil	Milk	Wheat Flour	Rice
				
Iron Iodine	Vitamin A Vitamin D (*Plant Source)	Vitamin A Vitamin D (*Plant Source)	Iron Folic Acid Vitamin B12	Iron Folic Acid Vitamin B12

KEY FEATURES

- Range (minimum – maximum) for micronutrient dosage
- Levels have been adjusted to provide 30- 50% of RDA
- Bioavailable sources of nutrients added for Iron fortification
- Only plant sources to be used for vitamin D
- Vanaspati fortification removed
- Transition time till 1st January, 2019 and enforcement will now begin

Fortified Staples & Micronutrients



Iron
850-1100
ppm
Iodine
15-30 ppm



Iron
28-42.5 mg
/ kg
Folic Acid
75-125
mcg
**Vitamin
B12**
0.75-1.25
mcg / kg



Iron
28-42.5 mg
/ kg
Folic Acid
75-125
mcg
**Vitamin
B12**
0.75-1.25
mcg / kg



Vitamin A
6-9.9 mcg
RE / gm oil
Vitamin D
0.11-0.16
mcg / gm
oil



Vitamin A
270-450
mcg RE
Vitamin D
5-7.5 mcg

HEALTH CLAIMS

SL.No	NUTRIENTS	CLAIMS
1.	Vitamin A	Helps against night blindness
2.	Vitamin D	Supports strong bones
3.	Vitamin B12	Important for maintaining normal functioning of nervous system and blood formation
4.	Folate & Folic Acid	Important for fetal development and blood formation
5.	Iron	Fights Anemia
6.	Iodine	Required for normal growth, thyroid and brain function
7.	Zinc	Supports a healthy immune system
8.	Thiamine	Required for normal nerve and heart function
9.	Riboflavin	Necessary to release energy from food
10.	Niacin	Necessary to release energy from food
11.	Pyridoxine	Necessary to release energy from food

Open Market Availability

Fortified Edible Oil



Fortified Wheat Flour



Fortified Milk



Fortified Rice



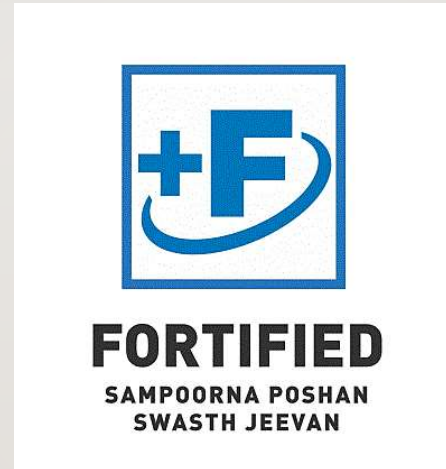
Double Fortified Salt



LABEL DECLARATION

- Ingredient declaration
- Nutritional information declaration
- Fortification logo
- “Fortified with.....(name of the fortificant)”

LOGO



COMPLAINCE : +F LOGO REGISTRATIONS

12

+F registration linked to FoSCoS

- FRK manufactures to get license under 99.5 category
- FBOs to endorse their products and obtain +F logo via FOSCOS
- FAQs on packaging and labelling support available by FFRC
- Levels 1-4 in the food product category

FSAI No. F.29014/PSAI/PCS-FLRS/WORK IN 167/ 2018
Food Safety and Standards Authority of India
(Regulatory Compliance Division)
1A Secretary Authority established under Food Safety and Standards Act, 2006
PSA Bhawan, Kirti Road, New Delhi - 110002
Dated: 21st August, 2018

ORDER

Subject: Endorsement for +F logo within the FLRS - reg.

Sir/ Madam,

Food Safety and Standards (Fortification of Foods) Regulations, 2018 has been Gazette notified dated 2nd August 2018. As per the regulation, every package of fortified food shall carry the logo on the label, as specified in the schedule II of these regulations.

2. To simplify the ongoing process of +F logo registration on the website of Food Fortification Resource Centre (FFRC), an endorsement procedure has been integrated within the existing FLRS, wherein FBO will be able to endorse their fortified products and obtain CDR file of +F logo.

3. All Food Business Operators (FBOs) engaged in manufacturing/ processing/ and relabelling/ repacking of fortified food products shall endorse their fortified food product in existing license/ registration. The FBOs shall complete this endorsement by 31st December 2018. The process flowchart is attached as Annexure-1.

4. This has the approval of the Competent Authority.

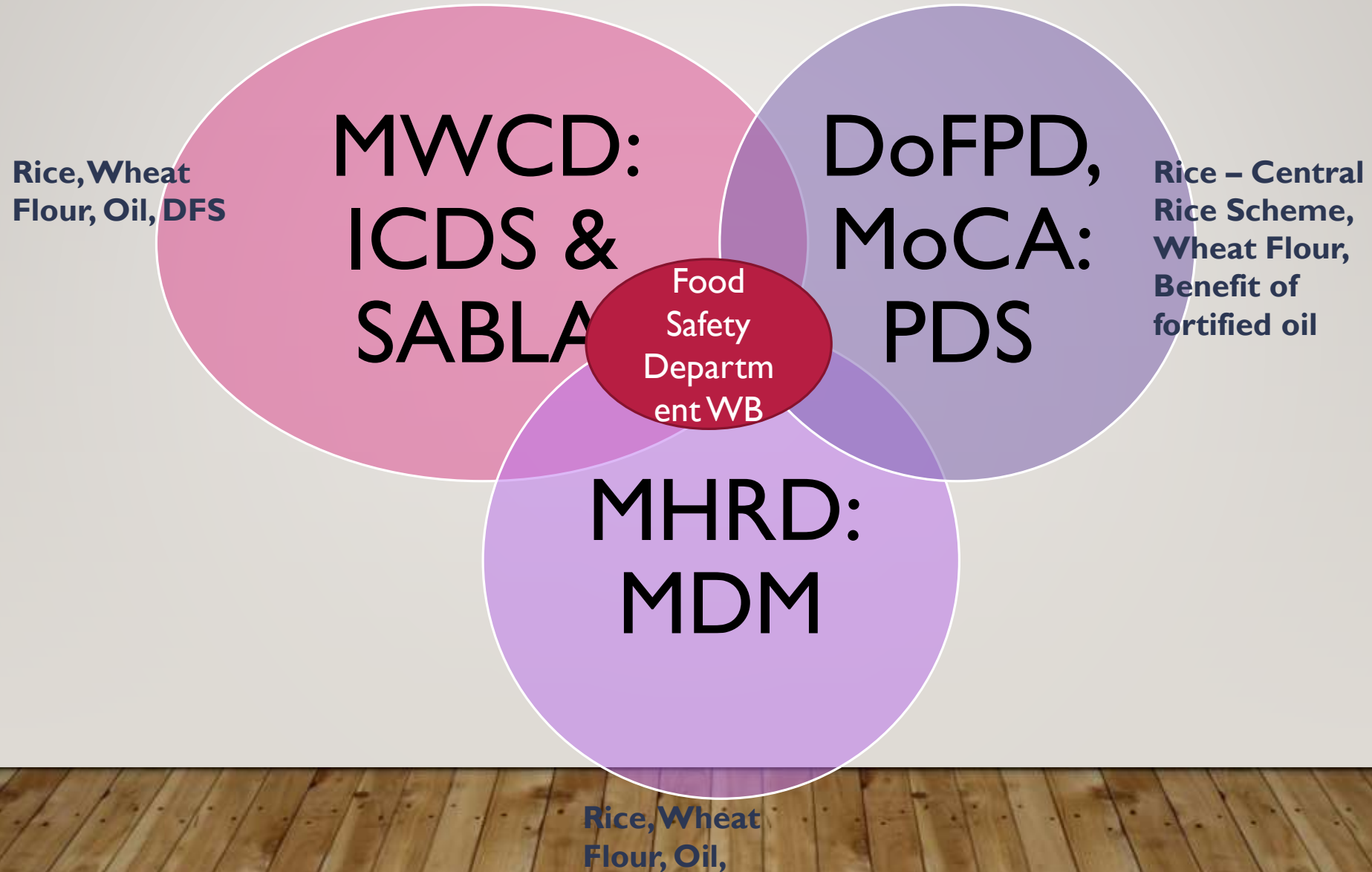
Yours sincerely,



FOOD FORTIFICATION : GOVERNMENT

MoHFW has been appointed as the nodal Ministry for fortification by PMO

OVERVIEW

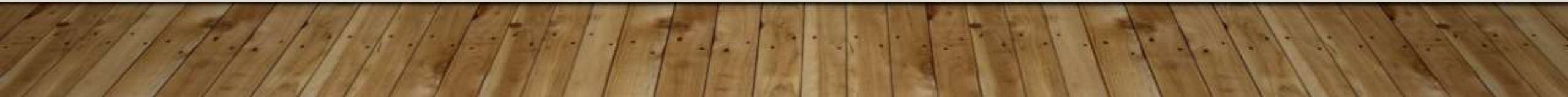


In India, salt, wheat, rice, milk, and oil are identified as appropriate vehicles for fortification.





West Bengal Government has started distribution of fortified atta through public distribution system against the order “West Bengal Urban Public Distribution System (Maintenance and Control) order 2013.’ Public Distribution of fortified atta in Darjeeling District is latter taken as roll model in other state.



FORTIFICATION PROCESS

Powdered vitamins and minerals are added to flour during the milling process using equipment called feeders.



A large mill may use a “feeder bank” such as this set of four. One feeder is for fortification and three are for other flour improvers.

Photo courtesy of Research Products Company



Smaller mills may use a single feeder for fortification.

Photo copyright: David Snyder / CDC Foundation

IMPACT ON HEALTH: IRON

Burden of Deficiency

- Reduced productivity
- Iron deficiency anemia
- Undeveloped mental capacity
- Maternal mortality
- Pre-term births

Health Benefits

- Increased productivity
- Fully developed mental skills
- Improved maternal and child health

“Iron deficiency affects more people than any other condition, constituting a public health condition of epidemic proportions. ”

-World Health Organization

<http://www.who.int/nutrition/topics/ida/en/>

*EACH YEAR OF FLOUR
FORTIFICATION IS
ASSOCIATED WITH A
2.4% DECREASE IN
ANEMIA.*



Barkley, J., Wheeler, K., and Pachón, H. Anaemia prevalence may be reduced among countries that fortify flour. [British Journal of Nutrition](#), 2015. 114, pp 265-273. doi:10.1017/S0007114515001646.

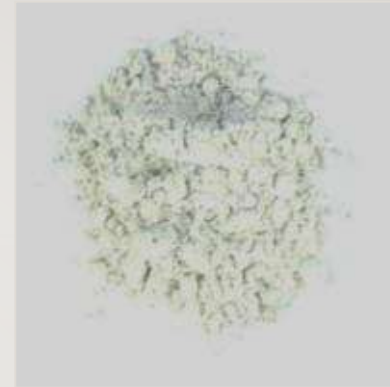
MINERALS AND VITAMINS USED IN FLOUR FORTIFICATION

Minerals	Vitamins
• Iron • Zinc	• Folic Acid (B9) • Thiamine (B1) • Riboflavin (B2) • Niacin (B3) • B12 • Vitamin A • Vitamin D

TYPES OF IRON USED IN FORTIFICATION



Elemental Iron
(reduced iron or electrolytic iron)



Ferrous Sulfate



Ferrous Fumarate



Sodium Iron EDTA (NaFeEDTA)

FACTORS FOR CHOOSING IRON COMPOUND

- **Bioavailability** (absorption)
 - Water soluble compounds have the highest relative bioavailability because they are very soluble in gastric juices.
 - The size, shape and surface area of the iron particle affects bioavailability, as does composition of food made with fortified flour.
- **Sensory changes**
 - High levels of some iron compounds could cause coloration or rancidity of the flour.
- **Cost:**
 - Highly bioavailable forms of iron are more expensive, but less is needed per metric ton of flour for fortification to have a health impact.
- **Magnets:**
 - Iron salts (ferrous sulfate, ferrous fumarate and iron EDTA) will not be attracted to magnets that may be used in milling process

(FSSAI) STANDARDS FOR FORTIFICATION OF FOODS

Salt

- 1) Iodized salt (when fortified with Iodine)
- 2) Iron fortified iodized Salt (Double Fortified Salt) when fortified with Iron and Iodine Salt shall be fortified with Iodine I and may also be fortified with iron in combination 2 with iodine

Component Level of nutrients Source of nutrients	Component Level of nutrients Source of nutrients	Component Level of nutrients Source of nutrients
Iodine content		
(a) Manufacture level (b) Distribution channel including retail level	(b) Distribution channel including retail level 20-30 parts per million (on dry weight basis) 15-30 parts per million (on dry weight basis)	Potassium Iodate
Iron content (as Fe)	850-1100 parts per million	Ferrous sulphate or Ferrous Fumarate

Fortified Oil

Nutrient
Vitamin A
Vitamin D

6 μg RE - 9.9 μg RE
per gm of oil
0.11 μg – 0.16 μg
per gm of oil.

Retinyl acetate or
Retinyl palmitate
*Cholecalciferol or
*Ergocalciferol
(*Only from Plant
Source)

Fortified Milk

Vitamin A
Vitamin D

270 μg RE - 450
 μg RE
5 μg - 7.5 μg

Retinyl acetate or
Retinyl palmitate
*Cholecalciferol
or *Ergocalciferol
(*Only from Plant
source)

Fortified Atta, Maida, Raw Rice

Nutrient	Level of fortification per Kg
Iron- Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous BisGlycinate;	28 mg- 42.5 mg * mmmmd
or Sodium Iron (III) Ethylene diamine tetra Acetate Trihydrate (Sodium feredetate-Na Fe EDTA);	14 mg- 21.25 mg
Folic acid	75 µg- 125 µg
Vitamin B12- Cyanocobalamine or Hydroxycobalamine;	0.75 µg- 1.25 µg
Zinc- Zinc Sulphate;	10 mg- 15 mg
Vitamin A- Retinyl acetate or RetinylPalmitate;	500 µg RE- 750 µg RE
Thiamine (Vitamin B1)- Thiamine hydrochloride or Thiamine mononitrate;	1 mg- 1.5 mg
Riboflavin (Vitamin B2)- Riboflavin or Riboflavin 5'phosphate sodium ;	1.25 mg- 1.75 mg
Niacin(Vitamin B3) -Nicotinamide or Nicotinic acid;	12.5 mg- 20 mg
Pyridoxine(Vitamin B6)- Pyridoxine hydrochloride;	1.5 mg- 2.5 mg

Packaging and Labeling Requirements

- (1) All fortified food shall be packaged in a manner that takes into consideration the nature of the fortificant added and its effect on the shelf life of such food.
- (2) Every package of fortified food shall carry the words “fortified with (name of the fortificant)” and the logo, specified in Schedule-II of these regulation, on its label. It may also carry a tag line “Sampoorna Poshan Swasth Jeevan” under the logo.
- (3) provisions of the Food Safety and Standards (Packaging and Labeling) Regulations, 2011, shall also apply to the fortified foods.
- (4) Every package of food, fortified with Iron shall carry a statement “People with Thalassemia may take under medical supervision”.
- (5) All manufacturers and packers of fortified food complying with the provisions of the Act and rules or regulations made thereunder on fortified food shall be permitted to make a nutrition claim in relation to an article of fortified food under the Food Safety and Standards (Packaging and Labeling) Regulations, 2011.



FORTIFIED

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**Food Business operator can do endorsement of
Fortified Products through FLRS.**

FORTRACE [FORTIFIED RICE TRACEABILITY APPLICATION]

- User Manual for Manufacturers of Premix for FRK
- https://foscos.fssai.gov.in/assets/docs/FoRTrace_for_Premix_Manufacturers.pdf
- User Manual for Manufacturers of Rice Millers
- https://foscos.fssai.gov.in/assets/docs/FoRTrace_for_Rice_Millers.pdf
- User Manual for Warehouses
- https://foscos.fssai.gov.in/assets/docs/FoRTrace_for_Warehouses.pdf

RUCO

- <https://eatrightindia.gov.in/ruco/index>
- <https://eatrightindia.gov.in/ruco/enrolled-biodiesel-manufacturers.php> (list of Bio diesel manufacturer)

MORE INFORMATION

- Health, productivity and economic benefits of flour fortification:
http://www.ffinetwork.org/why_fortify/index.html
- World Health Organization recommendations for wheat and maize flour fortification:
http://www.who.int/nutrition/publications/micronutrients/wheat_maize_fortification/en/



Thank
you!!